Space Weather Forecast

Issued on Wednesday, 23 August 2023 at 01:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Ongoing chance of Moderate flares (R1-R2 Radio Blackouts). Slight chance G1 Minor Storms late day 1 or day 2 (23-24 Aug).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with the peak flare a lower Moderate flare at 22/2304 UTC from a region in the western disk. There are currently eight numbered regions on the visible disk. The majority are simple and mature spots with little development. However, the newly numbered AR3415 region rotating onto the southeast limb, along with the likely simpler, but moderately sized AR3413 and AR3405 provide some increased flare risk. The new region is a modestly sized, apparently complex region, although this assessment is low confidence, and further details are expected to become apparent as it rotates into a clearer view.

A filament eruption (which is the release of a line of plasma held together by the Suns magnetic field) was observed leaving the southwest disc at 21/1613 UTC, and a weak CME (coronal mass ejection) has been identified in the very limited imagery that is available. Confidence is very low, however at most a weak glancing interaction is possible later in the period. The recent Moderate flare from the western disk also looks likely to have produced some element of filament lift-off, and any resulting CME will be analysed as imagery becomes available.

Solar Wind / Geomagnetic Activity: The recent fast wind eased through the period. Solar wind speeds eased from elevated to be slightly elevated (around 520km/s to 450km/s). Total Interplanetary Magnetic Field (IMF) was weak with the north-south component varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is expected to be generally Low, but with a Chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs currently forecast, however a CME leaving the disc on 21 Aug has been tentatively assessed as giving the risk of a glancing transitory influence towards the end of the period. Current fast winds are expected to continue gradually and erratically easing into day 1 (23 Aug), before the potential arrival of the next fast wind enhancement. This is a low confidence however. Enhancement is most likely late day 1 or day 2 (23-24 Aug), with solar winds potentially rising again to around 500-550km/s. Mainly Quiet geomagnetic activity at first, with isolated Unsettled spells. There is a slight chance of Active intervals, most likely later day 1 and day 2 (23-24 Aug). There is a slight chance of isolated G1 Minor Storms with any arrival. Activity is expected to ease back to be mostly Quiet to Unsettled days 3 and 4 (25-26 Aug).

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background with no solar radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	20	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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